Demonstration of the Habitat Quantification Tool

Montana Environmental Quality Council Meeting
September 13, 2018

MONTANA SAGE GROUSE
Habitat Conservation Program

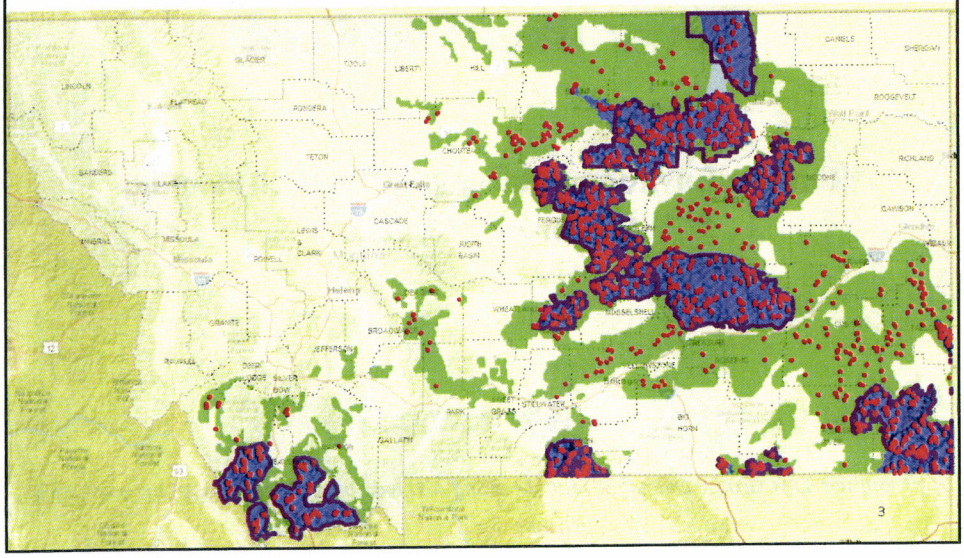
Montana Sage Grouse Oversight Team Meeting Archive: https://sagegrouse.mt.gov/Team

Acknowledgements:

- Mitigation Stakeholders (many and diverse)
- BLM, USFWS, USFS, NRCS, FWP
- SWCA Environmental Consultants
- Willamette Partnership
- DNRC, DNRC OIT (especially the GIS Team & Nick Swartz)
- Program Staff: Therese Hartman, Graham Neale, Jamie McFadden
- Countless others …

Areas of Focus for Sage Grouse Conservation

- *Executive Order 12-2015*
- *Sage Grouse Stewardship Act*



What is Mitigation?

- **Webster's**: making something less severe or damaging; lowering the impact; reducing risk of loss

What is Mitigation?

- **Webster's**: making something less severe or damaging; lowering the impact; reducing risk of loss

What does it have to do with sage grouse?

- Petitioned for listing under federal ESA: 8 times + litigation
- State trust wildlife species
- Need: development in sage grouse habitat
- Result: there will be impacts to sage grouse habitat, even if all recommendations are followed (Advisory Council, 2014)
- Outcome: balance development with conservation – mitigation is a tool

What is Mitigation?

- **Webster's**: making something less severe or damaging; lowering the impact; reducing risk of loss

What does it have to do with sage grouse?

- Petitioned for listing under federal ESA: 8 times + litigation
- State trust wildlife species
- Need: development in sage grouse habitat
- Result: there will be impacts to sage grouse habitat, even if all recommendations are followed (Advisory Council, 2014)
- Outcome: balance development with conservation – mitigation is a tool

Where and when does it apply? IF:

- need a state permit or authorization (or federal)
- development in designated habitat area (state or federal)
- not otherwise exempt from review in EO 12-2015 or by MSGOT

Why does it matter?

Mitigation keeps the scale level.

Mitigation must be timely, adequate, and effective to offset habitat losses.

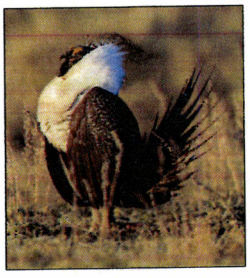
Habitat Gained or Conserved

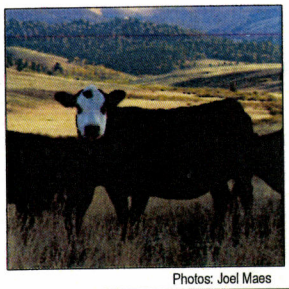
Habitat Lost or Impacted

Mitigation is how Montana gets to YES

Why does it *really* matter?

- ✓ **Sustain working landscapes, people, the economy**
- ✓ **Because a listing would have significant adverse effects on the economy of the state, including private and state trust lands**

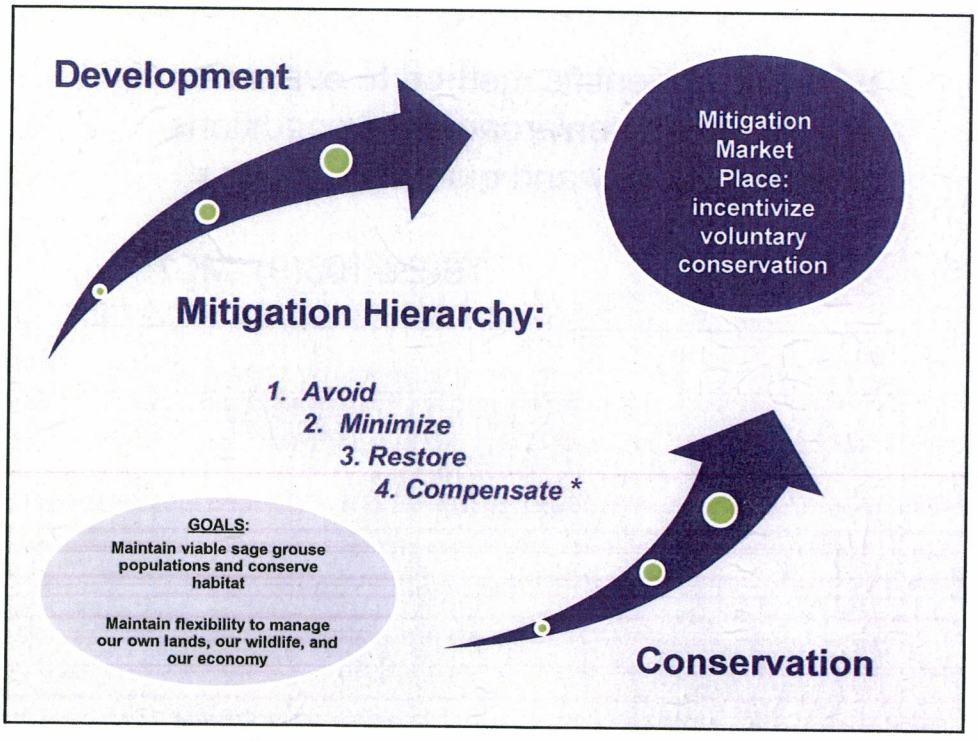


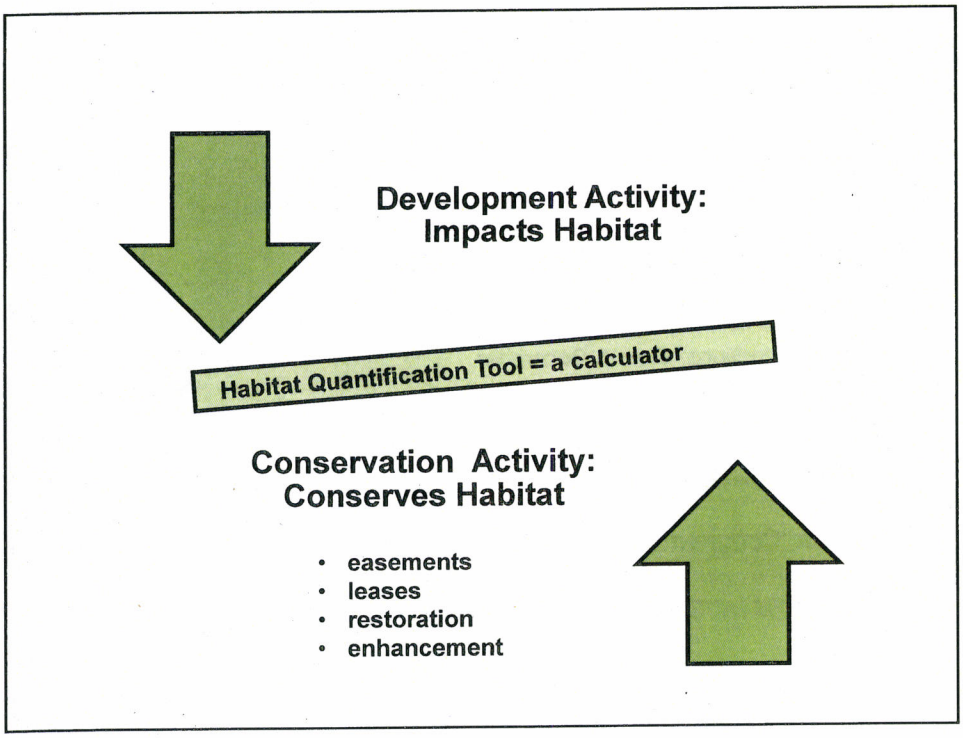


Photos: Joel Maes

Developing the Habitat Quantification Tool

1. **Stakeholders:**
   - September 2016 – May 2018
   - 10-12: 2-day meetings, webinars, conference calls
   - multiple drafts, comment opportunities
2. **MSGOT:** drafts, discussions, public comment
   - 2017 meetings: June & December
     - rulemaking: did not adopt
   - 2018 meetings: January & May
     - rulemaking: will complete in 2018
3. **Public Comment:** July 5 – August 9, 2018
4. **Independent Scientific Peer Review:** July 5 – August 16, 2018





HQT: the scientific method to evaluate vegetation and environmental conditions related to quality and quantity of habitat

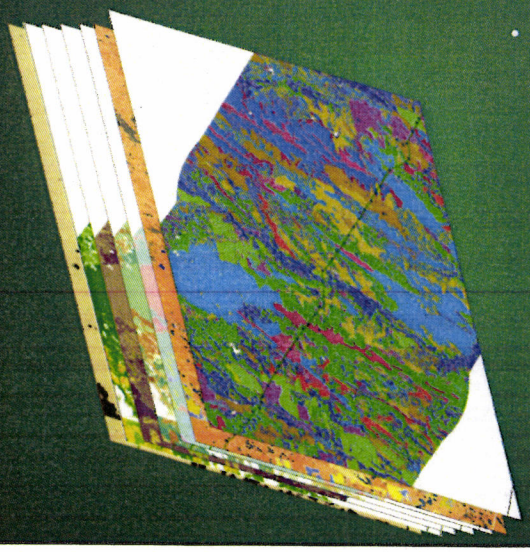
76-22-103(9), MCA

HQT: the scientific method to evaluate vegetation and environmental conditions related to quality and quantity of habitat

76-22-103(9), MCA

- A GIS model: calculates functional (Fx) acres
- Answers the questions:
  - How many functional acres are gained from conservation?
  - How many functional acres are lost due to development?

Four HQT Steps Using GIS:



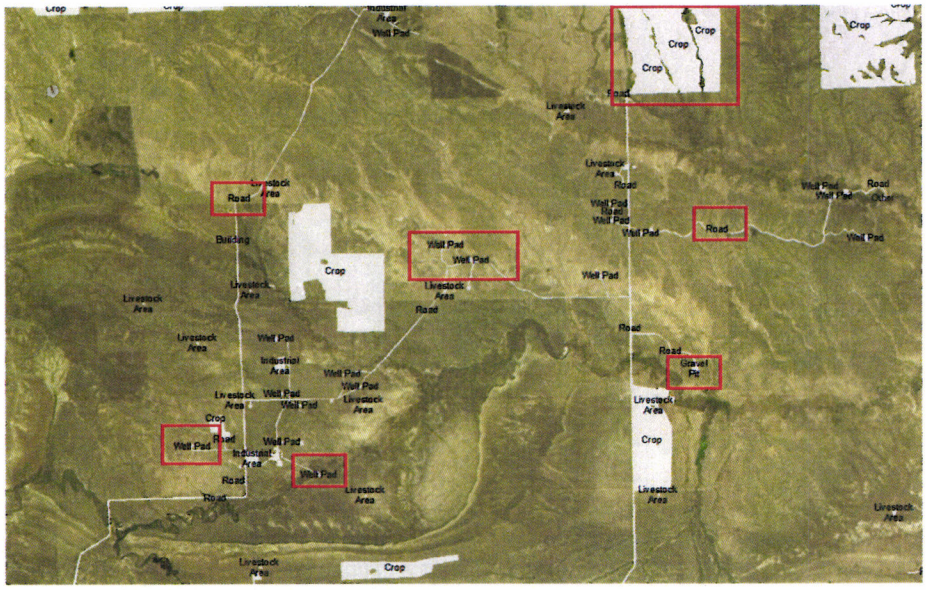
1. Create a Basemap
   - **vegetation**
   - **birds**
   - **existing development**
2. – assign values to individual cells for each variable
3. – stack up the individual layers
4. – determine final habitat quality score for each cell between 0-100 (raster math)

SWCA

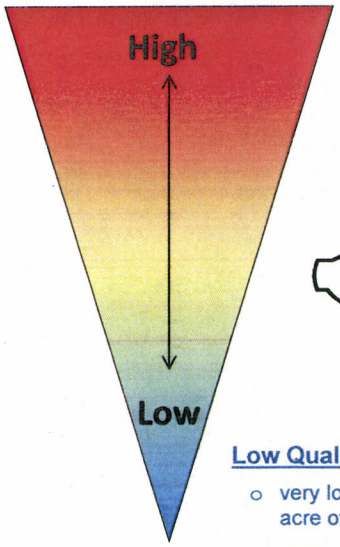
Basemap :
Heads-up
Digitized
Existing
Anthropogenic
Disturbance

Basemap:
Heads-up
Digitized
Existing
Anthropogenic
Disturbance

Disturbances: Categorized by Type



Habitat Quality Continuum



High Quality:

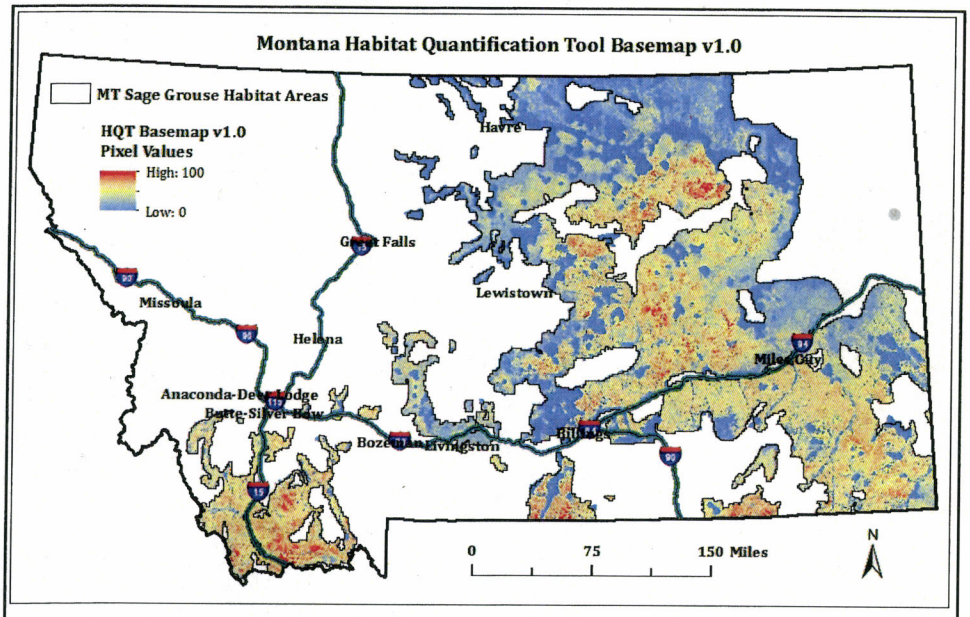
- very high number of functional acres for each physical acre of land
- more and darker red per unit area

Each cell on the basemap gets a number somewhere on this continuum

- vegetation, birds, existing disturbance

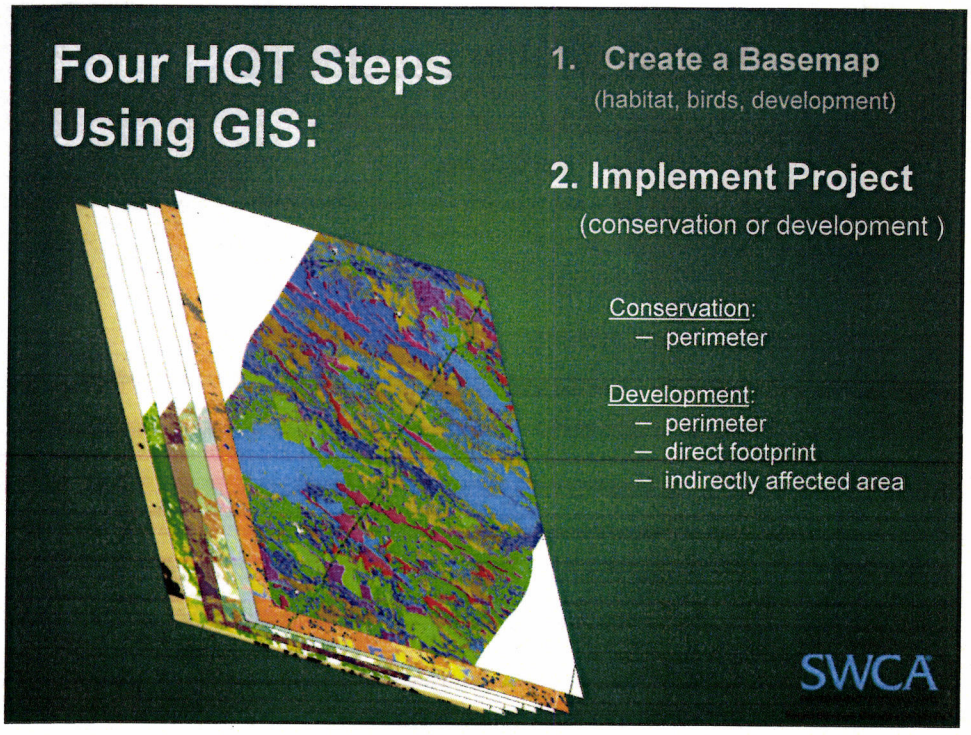
Low Quality:

- very low number of functional acres for each physical acre of land
- more and darker blue per unit area

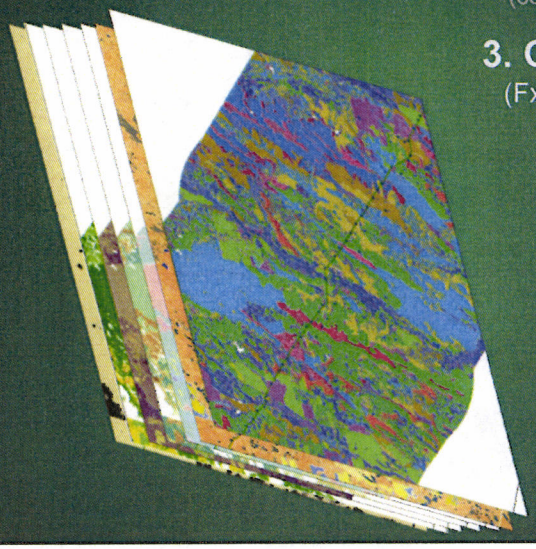


Note about Red Areas:

- *match up well with Core Areas – areas of highest priority for conservation*
- *more birds, higher quality vegetation, less existing disturbance*



Four HQT Steps Using GIS:



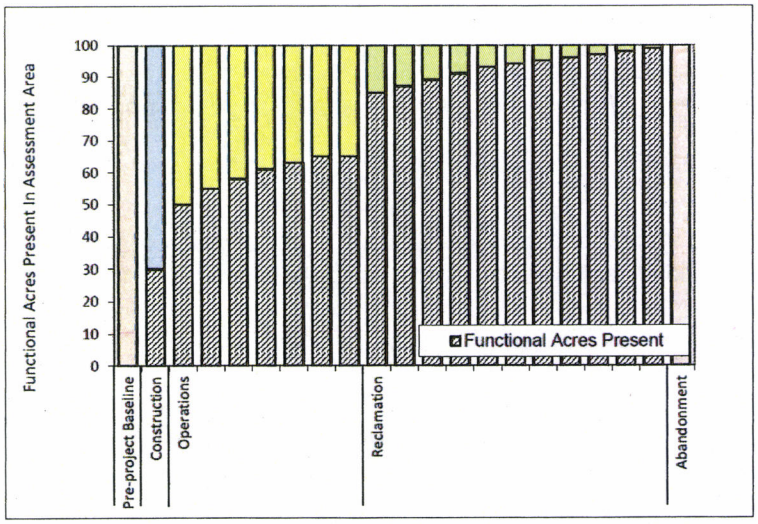
1. **Create a Basemap**
   (habitat, birds, development)
2. **Implement Project**
   (conservation or development)
3. **Quantify**
   (Fx-acre gains or losses)

Process:

- cut down through all basemap data layers
- assign new composite value to each cell within project area
- clip to only designated habitat areas
- sum the total, compare to baseline

SWCA

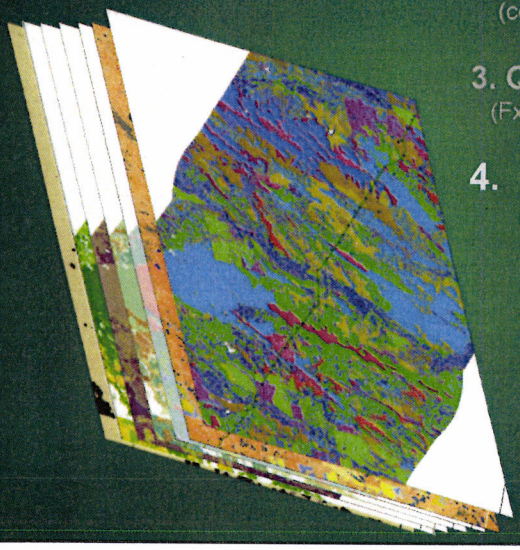
Step 3: HQT Includes Time Construction, Operations, Reclamation



phases calculated individually.

SWCA ENVIRONMENTAL CONSULTANTS Sound Science. Creative Solutions.

Four HQT Steps Using GIS:



1. **Create a Basemap**
   (habitat, birds, development)
2. **Implement Project**
   (conservation or development)
3. **Quantify**
   (Fx-acre gains or losses)
4. **Field Validation**
   (adjust scores if needed)

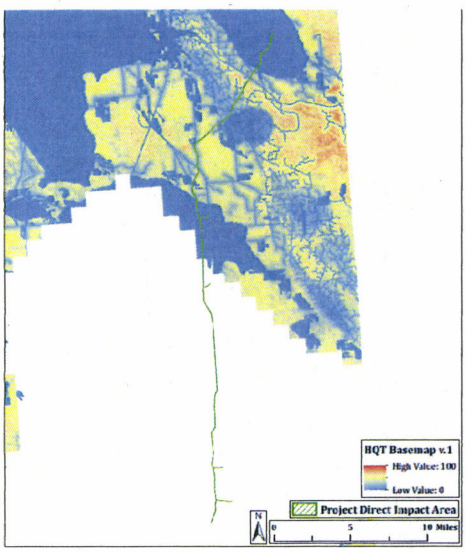
Process:
- collect field data
- adjust individual cell values
- re-run the model to quantify gains or losses

SWCA

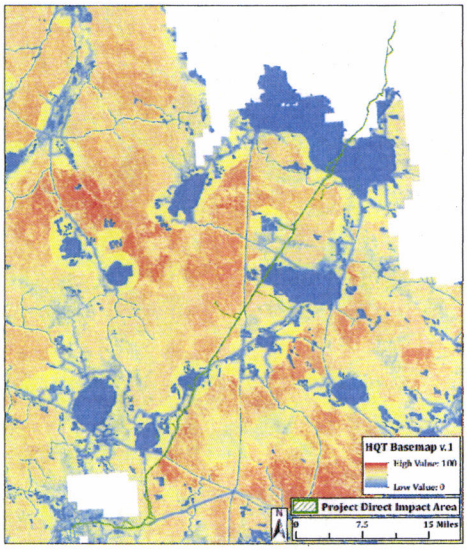
HQT: Pipeline Development Example

- 110 mile long pipeline
  - construction = 1 year
  - operations = 0 since buried feature (once in operation, no more surface disturbance)
  - reclamation = 75 years
- Crosses two core areas, general habitat, BLM Priority Habitat, BLM Restoration Area, Montana State Trust Lands, private
- Multiple permits needed, but Program is 1-stop shop
- Worked with Proponent and BLM to develop single mitigation plan
  - mitigation hierarchy, including compensatory
  - permittee-responsible projects to offset impacts

Step 1 Basemap: Two Segments



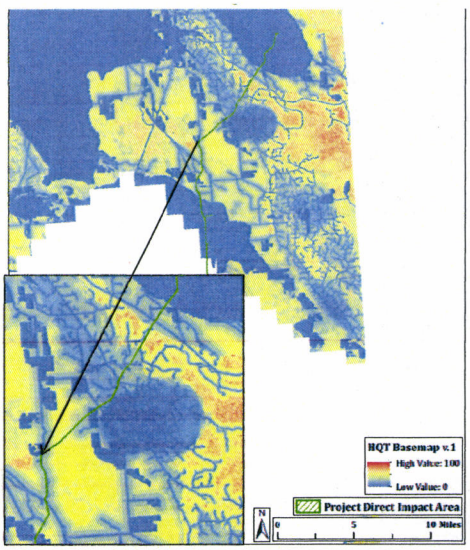
Cedar Creek:
- Core Area & General Habitat



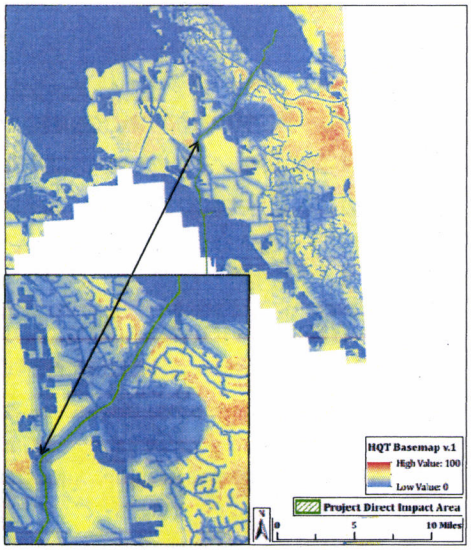
Carter County:
- Core Area & General Habitat

Steps 2 and 3: Implement & Quantify Functional Acres Lost

Cedar Creek: Core Area & General Habitat



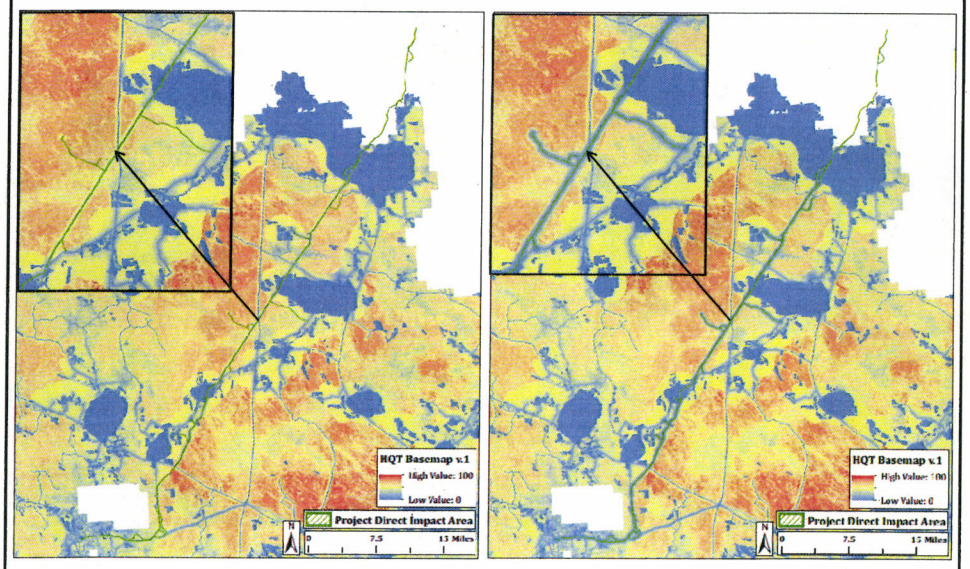
Basemap (pre-project baseline)



Construction, Operations Phases

Steps 2 and 3: Implement and Quantify Functional Acres Lost

Carter County: Core Area & General Habitat



Basemap (pre-project baseline)

Construction, Operations Phases

Step 4: Field Validation

- Field validation is optional for developers
  - stakeholder concerns about burden, cost etc.
  - protocols in place so developers could, if desired
  - HQT scores could go up or down
    - depends on actual site conditions
- Here: proponent had previously collected significant amount of field data
- No score adjustments needed

Pipeline Example:

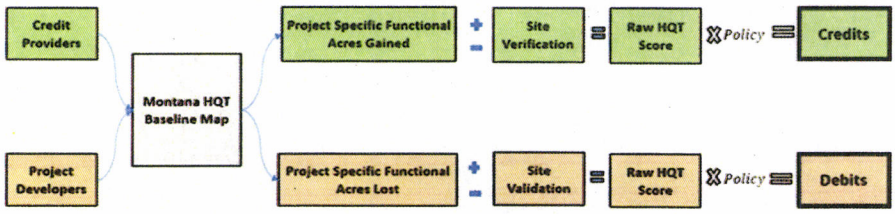
Table 7. Functional Acres Lost over Life of Project by Habitat

Habitat Area	Functional Acres Lost
Carter Core Area	7,419.67
Carter General Habitat	2,703.61
CCA Core Area	349.22
CCA General Habitat	656.43
Total	**11,128.93**

Remember: time is included, so numbers will seem high

(*it works the same way on the credit side*)

How do HQT functional acres lost turn into debits?



1 Functional Acre Lost = 1 Debit

What determines the total number of debits which need to be offset by credits?

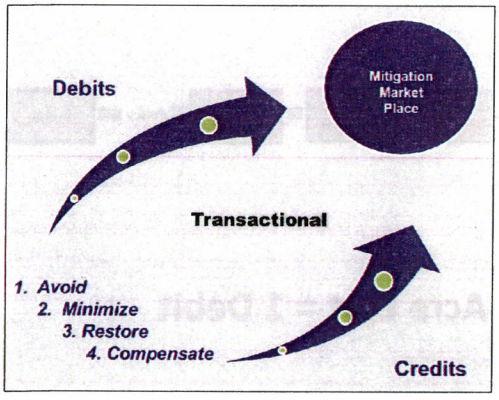
Total HQT score x policy multipliers = total debits

Modifiers provide clear policy signals to incentivize keeping impacts as low as possible and account for risk:

- reserve account (pooled insurance): 20% of HQT score
- deviations from Executive Order 12-2015

Debit: defined unit of trade representing the loss or resource functions or value at an impact or project site.
MCA 76-22-103

Policy +  HQT Score



Pipeline Example Total Debits: 17,310.09

HQT scores for all areas
+
multipliers

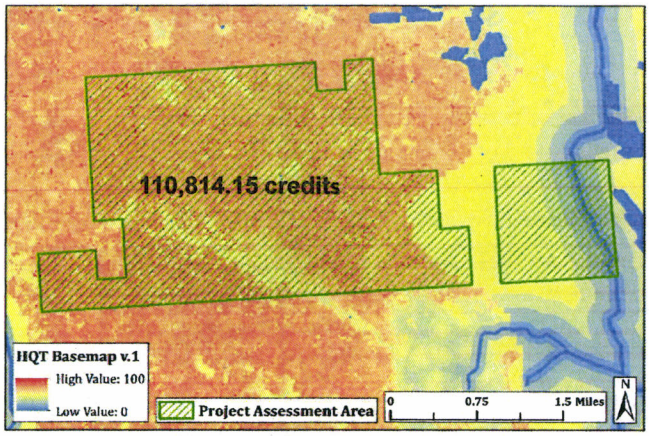
(includes some voluntary additions)

Table 8. Summary of Project Mitigation Requirements

Mitigation Component	Functional Acres
Carter Core Area Mitigation Requirements	
Raw HQT Score for Project - Core Area	7,419.67
Raw HQT Score for Project - General Habitat	2,703.61
Voluntary Landscape Multiplier - Core Area (10%)	741.97
Voluntary Landscape Multiplier - General Habitat (5%)	135.18
Voluntary Reserve Multiplier – Core Area (20%)	1,483.93
Voluntary Reserve Multiplier – General Habitat (20%)	540.72
Net Benefit Multiplier – Core Area (10%)	741.97
Net Benefit Multiplier – General Habitat (10%)	270.36
EO Deviation – DDCT Calculation >5% (10% applied to Construction and Operations Phase only)	632.53
EO Deviation – Seasonal Use (10% applied to Construction and Operations Phase only)	632.53
EO Deviation – Vegetation Removal (10% applied to Construction and Operations Phase only)	632.53
Total Carter Core Area Mitigation Requirements	15,935.00
Cedar Creek Anticline Core Area Mitigation Requirements	
Raw HQT Score for Project - Core Area	349.22
Raw HQT Score for Project - General Habitat	656.43
Voluntary Landscape Multiplier - Core Area (10%)	34.92
Voluntary Landscape Multiplier - General Habitat (5%)	32.82
Voluntary Reserve Multiplier – Core Area (20%)	69.84
Voluntary Reserve Multiplier – General Habitat (20%)	131.29
Net Benefit Multiplier – Core Area (10%)	34.92
Net Benefit Multiplier – General Habitat (10%)	65.64
Total Carter Core Area Mitigation Requirements	1,375.09
Total Project Mitigation Requirements	*17,310.09*

Permittee Responsible Actions: Create Own Credits to Offset Total Debits

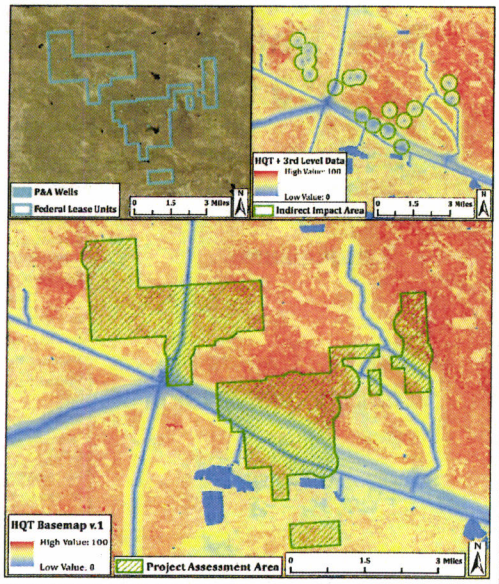
1. Secured perpetual conservation easement by working with the Montana Land Reliance and a willing private landowner in Carter County



Permittee Responsible Actions: Create Own Credits to Offset Total Debits

2. Work with current lessee to permanently plug and abandon 17 wells that are no longer in use:
   - private & BLM surface
   - federal mineral leases
   - permanently reclaim well pads; weed control
   - annual monitoring to ensure success

130,516.11 credits



Final Mitigation Summary

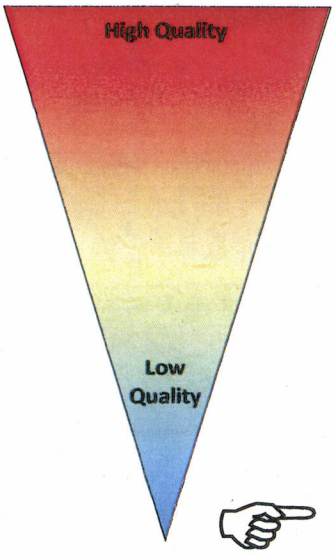
Credit Surplus: 224,020.17

(available for future development activities)

Table 10. Mitigation Calculation Summary

Mitigation Component	Functional Acres
Carter Core Area Mitigation Requirements	
Raw HQT Score for Project - Core Area	7,419.67
Raw HQT Score for Project - General Habitat	2,703.61
Landscape Multiplier - Core Area (10%)	741.97
Landscape Multiplier - General Habitat (5%)	135.18
Reserve Multiplier – Core Area (20%)	1,483.93
Reserve Multiplier – General Habitat (20%)	540.72
Net Benefit Multiplier – Core Area (10%)	741.97
Net Benefit Multiplier – General Habitat (10%)	270.36
EO Deviation – DDCT Calculation >5% (10% applied to Construction and Operations Phase only)	632.53
EO Deviation – Seasonal Use (10% applied to Construction and Operations Phase only)	632.53
EO Deviation – Vegetation Removal (10% applied to Construction and Operations Phase only)	632.53
Total Carter Core Area Mitigation Requirements	15,935.00
Cedar Creek Anticline Core Area Mitigation Requirements	
Raw HQT Score for Project - Core Area	349.22
Raw HQT Score for Project - General Habitat	656.43
Landscape Multiplier - Core Area (10%)	34.92
Landscape Multiplier - General Habitat (5%)	32.82
Reserve Multiplier – Core Area (20%)	69.84
Reserve Multiplier – General Habitat (20%)	131.29
Net Benefit Multiplier – Core Area (10%)	34.92
Net Benefit Multiplier – General Habitat (10%)	65.64
Total Carter Core Area Mitigation Requirements	1,375.09
Total Project Mitigation Requirements	*17,310.09*
Ringling Ranch Credits	277,035.38
40% of Credits Available for Mitigation	110,814.15
Ringling Ranch Mitigation Credits Available	*110,814.15*
Hammond Field Federal Lease Conservation Credits	109,812.60
Hammond Field Restoration Credits	20,703.60
Hammond Field Mitigation Credits Available	*130,516.11*
Total Mitigation Credits Available	**241,330.26**
Remaining Mitigation Credits*	**224,020.17**

Recap: what drives HQT results and debits?



HQT scores depend on:

- underlying habitat quality (red or blue?)
- project location (core vs. general?)
- project type (above or below ground?)
- project size (big or small?)
- project duration (short or long?)

Total debits depend on:

- multipliers; scale to the project HQT score
  - will vary, but reserve account common to all
  - consistency with Executive Order 12-2015?

Results and Obligations: proportional, commensurate with habitat, project type, location, time, & impacts

HQT: 44 Ranch Conservation Easement

- Funded by Stewardship Account:
  - MT: $1,500,000
  - NRCS, private match
- Easement held by Montana Land Reliance
- Closed 2016; perpetuity
- Fergus, Petroleum counties
- 18,033 physical acres; core area
- Protective of sage grouse, habitat
- State 3rd party right of enforcement

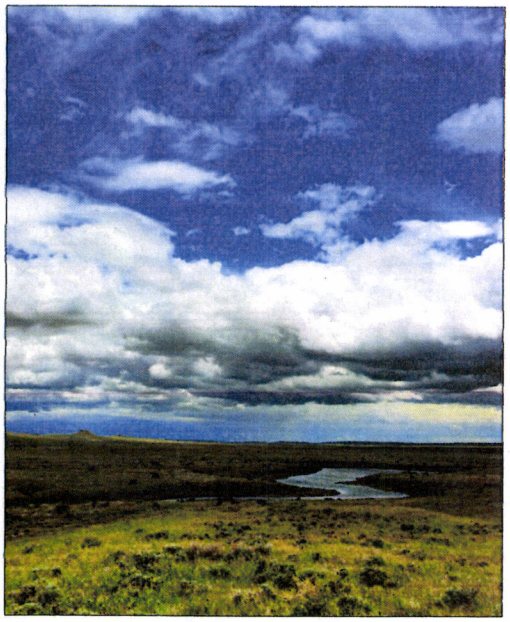
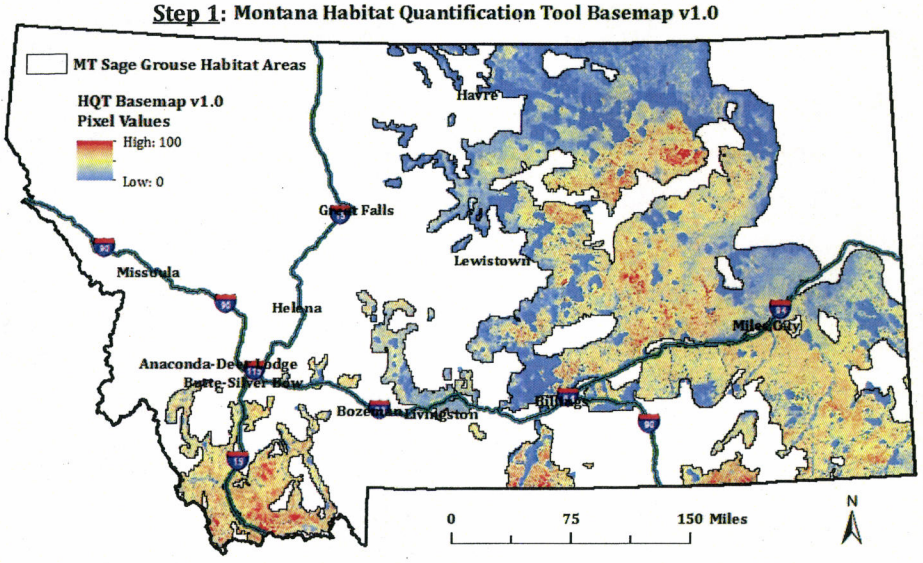


Photo: Montana Land Reliance

Step 1: Montana Habitat Quantification Tool Basemap v1.0

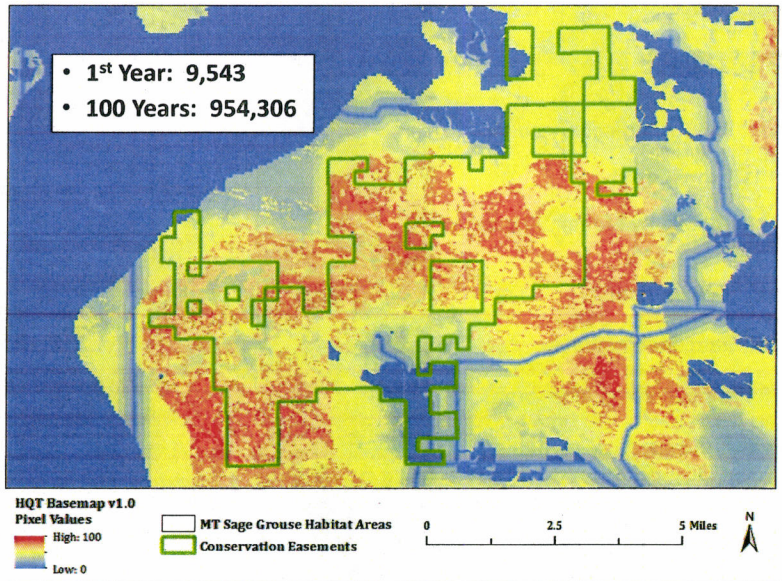


Note about Red Areas:

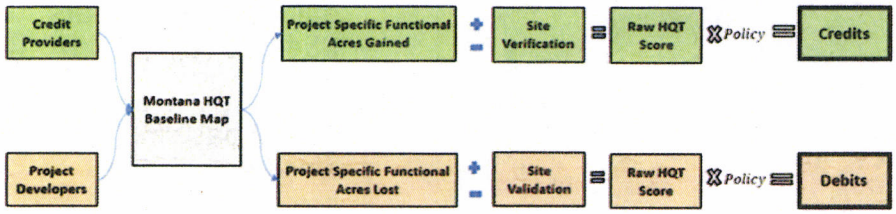
- *match up well with Core Areas – areas of highest priority for conservation*
- *more birds, higher quality vegetation, less existing disturbance*

Steps 2 and 3: Implement and Quantify Functional Acres Gained

(applying July 2018 HQT version so comparable with pipeline example)



How do HQT functional acres gained turn into credits?



1 Functional Acre Gained = 1 Credit

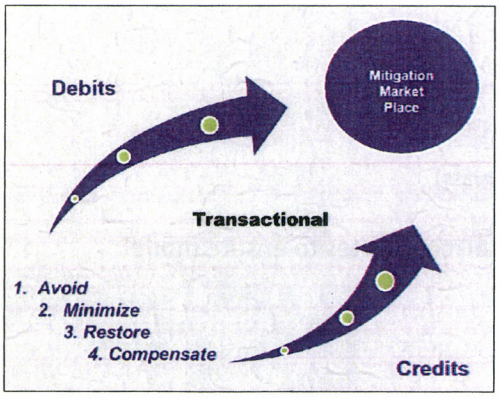
1 Functional Acre Lost = 1 Debit

Debit: defined unit of trade representing the loss or resource functions or value at an impact or project site. MCA 76-22-103

Policy

HQT Score

+ Policy

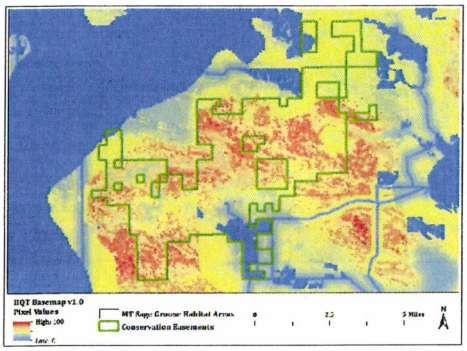


Credit: defined unit of trade representing the accrual or attainment of resource functions or value at a proposed project site.

The unit of measure for a debit is the same as for a credit. MCA 76-22-103

How many credits are estimated from the 44 Ranch?

(applying July 2018 HQT version so comparable with pipeline example)



Remember: time is included, so numbers will seem high

(it works the same way on the debit side)

1. Total functional acres gained for 100 years: 954,306 (est.)

2. Adjust baseline to 40% since easements protect status quo well, but do not create new Fx-acres:

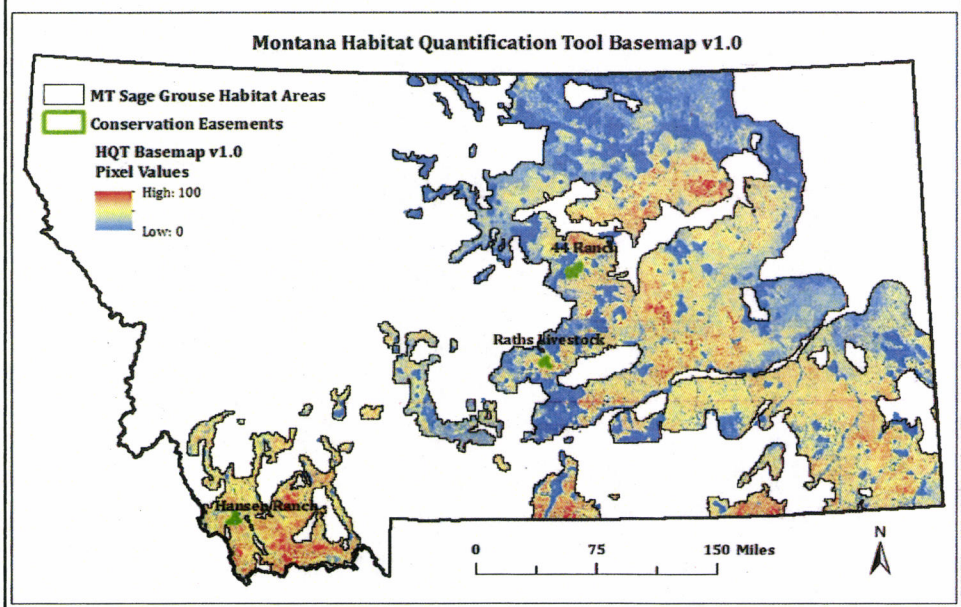
   954,306 x 0.40

381,722 credits
(estimated)

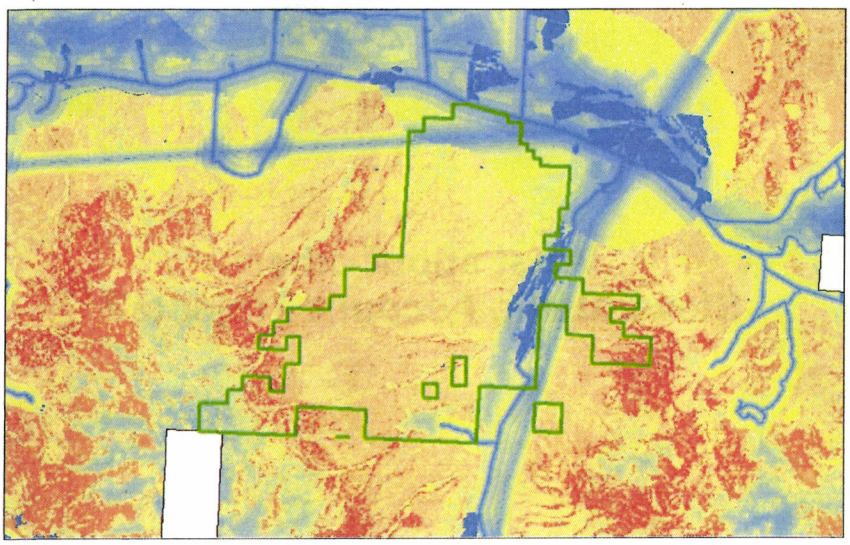
Step 4: [Future] Field Validation

- After MSGOT designates the HQT and completes administrative rulemaking, will run the HQT retroactively:
  - functional acres gained – final
  - convert to credits
- Will do field validation
  - vegetation
  - surface disturbance
  - invasive species (e.g. cheat grass)
- Field validation required for all credit sites to ensure model results correct

What about other Stewardship Account Projects?



Montana Habitat Quantification Tool: Hansen Ranch

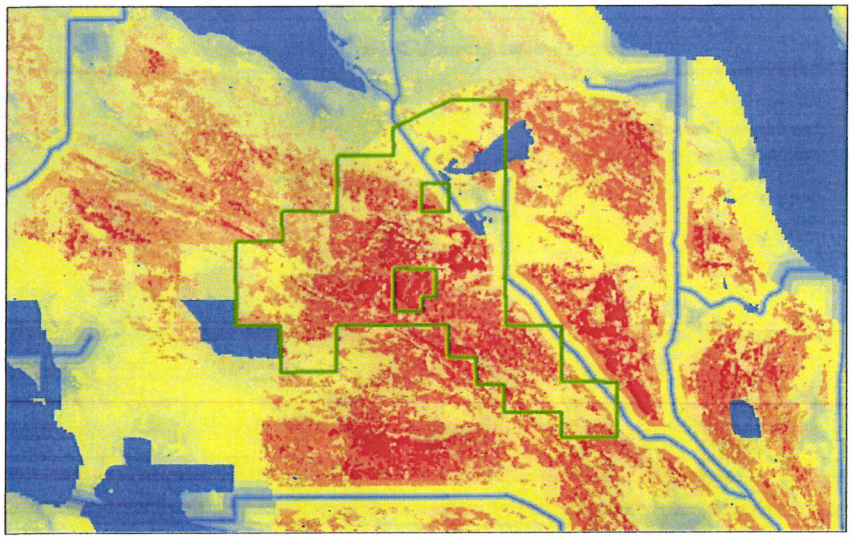


HQT Basemap v1.0
Pixel Values
High: 100
Low: 0

MT Sage Grouse Habitat Areas
Conservation Easements

290,142 credits
(estimated)

Montana Habitat Quantification Tool: Raths Livestock

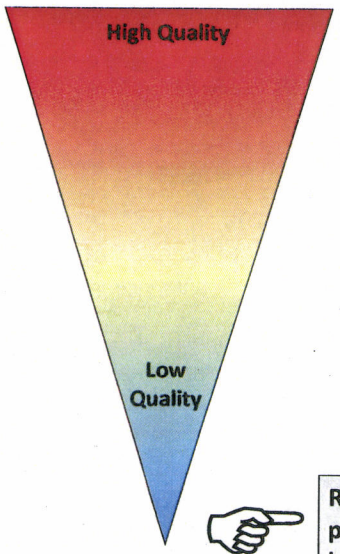


HQT Basemap v1.0
Pixel Values
High: 100
Low: 0

MT Sage Grouse Habitat Areas
Conservation Easements

286,489 credits
(estimated)

Recap: what drives HQT results and credits?



HQT scores depend on:

- underlying habitat quality (red or blue?)
- project location (core vs. general?)
- project type (easement, restoration, or enhancement?)
- project size (big or small?)
- project duration (short or long?)

Total credits depend on:

- multipliers; scale to the project HQT score
  - creating any new functional acres?

Results and Opportunities:
proportional, commensurate with project type, habitat quality, location, size, & if new Fx-A created

Coming Full Circle: HQT and Policy

1. **HQT results are commensurate, proportional to project**
   - policy neutral
   - objective, data-driven
   - repeatable
   - site validation can modify up or down
2. **Use policy to encourage / discourage actions**
   - multipliers: incentivize consistency with EO
   - multipliers: incentivize creation of new Fx-acres
   - address unique situations
3. **Location, Location, Location!**
   - Where is the project on the landscape?
   - What is happening at the site?
4. **Adaptive management, transparency**

Debits

Mitigation Market Place: incentivize voluntary conservation

Mitigation is Transactional:

- free market mechanisms
- incentive-based

GOALS:

Maintain viable sage grouse populations and conserve habitat

Maintain flexibility to manage our own lands, our wildlife, and our economy

Credits

(largely from private lands)

2020 Conservation Assessment

1. How are the birds doing?
2. What happened to the land?


www.sagegrouse.mt.gov
MONTANA.GOV
OFFICIAL STATE WEBSITE
SERVICES
AGENCIES
MT Sage Grouse Habitat Conservation Program
ABOUT
FAQ
MAP
LOGIN
Montana Sage Grouse
Habitat Conservation Program
PROGRAM INFORMATION
Join the Mailing List
MONTANA SAGE GROUSE OVERSIGHT TEAM
Members
Meeting Archive
GRANTS
Grant Information
2016 Grants
PROJECTS
Start or Follow Up on a Project
Check if you are in habitat
MSGOT
Information
MONTANA.GOV
OFFICIAL STATE WEBSITE